IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant[s]:	Erik Dahlman, *et al.*	§	Group Art Unit:	2684
Serial No:	09/873,309	§	Examiner:	Raymond S. Dean
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For: Methods and Arrangements in a Telecommunications System

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Date: March 17, 2005

Name: Jacqueline Wilson

Signature: Jacqueline Wilson

APPEAL UNDER 35 U.S.C. §134

Real Party in Interest

The real party in interest, by assignment, is: Telefonaktiebolaget LM Ericsson (publ)
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Stockholm, Sweden

Related Appeals and Interferences

None.

Status of Claims

Claims 1-20 are pending. Claims 1-13, 16 and 18-20 stand rejected, under 35 U.S.C. §103(a), as being unpatentable over Baum, *et al.* (US 6,385,462 B1) in view of

Chuah, *et al.* (US 6,693,952 B1), and claim 14 as being unpatentable over Baum in view of Chuah and in further view of Balachandran, *et al.* (US 6,567,375 B2). Claims 15 and 17 stand objected to as being dependent upon rejected base claims, but the Examiner has indicated such claims would be allowable if rewritten in independent form, including all of the limitations of their respective base claims and any intervening claims.

Status of Amendments

No amendments to the claims have been made.

Summary of Invention

The claimed invention selects a modulation and coding scheme on a shared first channel based on the instantaneous transmit power of a second channel, which is dedicated ("unique") for each mobile user in a cellular radio system. The Applicants' invention recognizes that in some systems, such as CDMA-based systems, the dedicated channel (*e.g.*, dedicated physical channel "DPCH") is power-controlled, and thus the signal-to-interference ratio at the receiver is, more or less, constant; *i.e.*, no information about the varying radio channel quality is available at the receiver. Furthermore, using the transmitted power level of the dedicated (second) channel to control the modulation and coding scheme of the shared first channel, rather than the received power level, eliminates the need for feedback signaling from the receiver (*e.g.*, mobile station) to the transmitter (*e.g.*, base station).

Issues

Whether one or more of the claims, as pending, are patentable over the cited references.

Argument

The Examiner rejected claims 1-13, 16 and 18-20 as being unpatentable over Baum, *et al.* (US 6,385,462 B1) in view of Chuah, *et al.* (US 6,693,952 B1), and claim 14 as being unpatentable over Baum in view of Chuah and in further view of Balachandran, *et al.* (US 6,567,375 B2). The Applicants traverse the rejections.

Claim 1 recites:

> 1. A method of transmitting information in a radio communication system comprising at least one transmitter and at least one receiver, the method comprising the steps of:
>
> transmitting first information in a first channel from the at least one transmitter to the at least one receiver, using in the transmitting a modulation and/or coding scheme and adapting the modulation and/or coding scheme to give a secure communication of the first information, and
>
> transmitting second information in a second channel from the at least one transmitter to the at least one receiver and setting the power used for transmitting in the second channel to give a secure communication of the second information, wherein in the step of transmitting the **first** information, the choice of the **modulation and/or coding scheme** is controlled by the level of the power at each instant set for transmitting in the **second** channel. (emphasis added)

As described in Applicants' specification, the claimed invention selects a **modulation and coding scheme** on a shared first channel **based on the instantaneous transmit power** of a second channel, which is dedicated ("unique") for each user. The Applicants' invention recognizes that in some systems, such as CDMA-based systems, the dedicated channel (*e.g.*, dedicated physical channel "DPCH") is power-controlled, and thus the signal-to-interference ratio at the receiver is, more or less, constant; *i.e.*, no information about the varying radio channel quality is available at the receiver. Furthermore, using the transmitted power level of the dedicated (second) channel to control the modulation and coding scheme of the shared first channel, rather than the received power level, eliminates the need for feedback signaling from the receiver (*e.g.*, mobile station) to the transmitter (*e.g.*, base station). The Examiner has not pointed to any teaching in Chuah or Baum, that discloses those claimed features and, thus, he has failed to establish a *prima face* case of obviousness.

As the Examiner notes with respect to claim 1, Baum does not teach "a first channel transmitting first information and a second channel transmitting second information." (Final Office Action ("FOA"); page 4). To overcome that deficiency of Baum, the Examiner has looked to the teachings of Chuah, stating that Chuah teaches "a first channel transmitting first information and a second channel transmitting second information." (FOA; page 4) The Examiner also asserts that Baum teaches "wherein in the step of transmitting said information, the choice of the modulation and/or coding scheme is controlled by the level of the power at each instant set (column 4, lines 22-25)." (FOA; page 3) Even assuming that Baum does teach what the Examiner asserts, that is not what the Applicant has claimed. The limitation of claim 1 to which the Examiner refers actually states that: "wherein in the step of transmitting the **first** information [on the **first** channel], the choice of the **modulation and/or coding scheme** is **controlled by the level of the power** at each instant set for transmitting in the **second** channel." (emphasis added) In other words, the transmit power of a **second** channel is used to control the choice of **modulation and/or coding scheme** on the **first** channel. This is not disclosed by Baum.

In the Examiner's rejection of claim 1, he states that Baum discloses "using in the transmitting a modulation and/or coding scheme and adapting the modulation and/or coding scheme to give a secure communication of the information" . . . "and setting the power used for transmitting said information . . ." (FOA; page 3, emphasis added). As stated by the Examiner, it appears that he equates "said information" to the same information in the first part. This is incorrect. A plain reading of claim 1 makes it clear that the first part refers to "first information" and the second part refers to "second information." But most importantly, claim 1 states that the **modulation/coding scheme** of the **first** link is adjusted as a function of the **transmit power** of the **second** link. In contrast, Baum describes varying the modulation/coding scheme for a link as a function of the transmit power of the **same** link.

At column 4, lines 22-25, as referenced by the Examiner, Baum teaches: "A modulation/coding rate unit 109 assigns a modulation/coding rate to each of the planned links based on a signal quality associated with the transmit power assigned to **the** link." (emphasis added) In other words, Baum discloses using the signal quality

associated with the transmit power assigned to a link to control the choice of modulation and/or coding scheme on that **same** link. This aspect of Baum is not the same as the limitation of claim 1, which recites that the transmit power of a **second** channel is used to control the choice of modulation and/or coding scheme on the **first** channel. The Examiner essentially concedes that Baum fails to disclose that claim limitation by stating that "Baum does not specifically teach a first channel transmitting first information and a second channel transmitting second information." (FOA, page 4; emphasis added) **If Baum doesn't teach such first and second channels, then it can't teach using the transmit power of a second channel to control the choice of modulation and/or coding scheme on the first channel.**

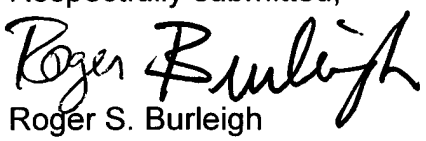
Having recognized the deficiencies of Baum, the Examiner looks to the teachings of Chuah. Chuah, however, provides no teaching that overcomes the deficiencies of Baum. In the FOA, the Examiner merely stated that Chuah teaches a first channel transmitting first information and a second channel transmitting second information. (FOA; page 4). In the Examiner's Advisory Action, however, the Examiner concludes that "Chauh . . . also teachs a **transmit power** of a **second channel** to control the **power level** of the **first channel**." (emphasis added) Even assuming the Examiner's statement is true, controlling the **POWER LEVEL** of a **FIRST CHANNEL** as a function of the **TRANSMIT POWER** of a **SECOND CHANNEL** is **not** the same as selecting the **MODULATION SCHEME AND/OR CODING RATE** of a **FIRST CHANNEL** as a function of the **TRANSMIT POWER** of a **SECOND CHANNEL**, as recited in Applicants' claim 1. Furthermore, there is no suggestion in Chuah to do so. Therefore, whereas Baum and Chuah fail to disclose the claimed limitation, the Examiner has failed to establish a *prima facie* case of obviousness of claim 1.

Whereas independent claims 16 and 18 recite limitations analogous to those of claim 1, those claims are also patentable over Baum in view of Chauh. Furthermore, whereas claims 2-14 are dependent from claim 1 and claim 20 is dependent from claim 16, and include the limitations of their respective base claims, those claims are also patentable over Baum in view of Chauh. The Applicants, therefore, respectfully request that the Examiner withdraw the rejection of claims 1-14, 16 and 18-20.

CONCLUSION

The claims currently pending in the application are patentable over Sawahashi, and the Applicants request that the Examiner's rejection thereof be reversed and the application be remanded for further prosecution.

Respectfully submitted,



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APPENDIX

Pending Claims

1. (Previously Presented) A method of transmitting information in a radio communication system comprising at least one transmitter and at least one receiver, the method comprising the steps of:

transmitting first information in a first channel from the at least one transmitter to the at least one receiver, using in the transmitting a modulation and/or coding scheme and adapting the modulation and/or coding scheme to give a secure communication of the first information, and

transmitting second information in a second channel from the at least one transmitter to the at least one receiver and setting the power used for transmitting in the second channel to give a secure communication of the second information, wherein in the step of transmitting the first information, the choice of the modulation and/or coding scheme is controlled by the level of the power at each instant set for transmitting in the second channel.

2. (Previously Presented) A method according to claim 1, wherein the second channel is transmitted from the same transmitter as the first channel.

3. (Previously Presented) A method according to claim 1, wherein the second channel is transmitted from one of a plurality of transmitters, comprising the transmitter that transmits the first channel.

4. (Previously Presented) A method according to claim 1, wherein the first physical channel is shared between several users and each user has a unique second channel wherein the modulation and coding scheme used by the first channel is determined by the instantaneous transmitted power of the second channel, the user of the second channel being currently served by the first channel.

5. (Previously Presented) A method according to claim 1, wherein the transmitter is a base station and the receiver is a mobile station.

6. (Previously Presented) A method according to claim 1, wherein the first channel is a shared downlink channel and the second channel is a dedicated physical channel.

7. (Previously Presented) A method according to claim 6, wherein the modulation and/or coding scheme used on the downlink shared channel when transmitting to a specific receiver is controlled by the power control commands transmitted by the receiver in the reverse link.

8. (Previously Presented) A method according to claim 7, wherein the power control commands are transmitted in combination with other information.

9. (Previously Presented) A method according to claim 6, wherein the power of the dedicated physical channel is mapped into a suitable modulation and coding scheme for the downlink shared channel.

10. (Previously Presented) A method according to claim 9, wherein a varying modulation and coding scheme is used on the downlink shared channel.

11. (Previously Presented) A method according to claim 9, wherein the mapping is static.

12. (Previously Presented) A method according to claim 9, wherein the mapping is dynamic.

13. (Previously Presented) A method according to claim 11, wherein a predefined table is used for mapping the power level to the modulation and coding scheme.

14. (Previously Presented) A method according to claim 12, wherein the mapping is changed as a function of some retransmission requests for data blocks being retransmitted over the shared channel.

15. (Previously Presented) A method according to claim 12, wherein at least two base stations are transmitting at the same time to the same mobile station, wherein the power of the DPCH is multiplied with a constant k, k >= 1, said constant being used for determining the modulation and coding scheme of the DSCH, both channels DPCH and DSCH transmitting from the same base station.

16. (Previously Presented) A method of modifying the transmission parameters in a radio communication system comprising at least one transmitter, at least one receiver, a first channel for transmitting first information from the at least one transmitter to the at least one receiver, and a second channel for transmitting second information from the at least one transmitter to the at least one receiver, the method comprising the steps of

setting the power used for transmitting in the second channel; and

adapting a modulation and/or coding scheme used in transmitting in the first channel, wherein in the step of adapting, the choice of the modulation and/or coding scheme is controlled by the level of the power at each instant set for transmitting in the second channel.

17. (Previously Presented) A method according to claim 16, wherein at least two transmitters are transmitting at the same time, wherein the power of the second channel is multiplied with a constant k.

18. (Previously Presented) A radio communication system comprising at least one transmitter, at least one receiver, a first channel for transmitting first information from at least one transmitter to the at least one receiver, and a second channel for transmitting second information from the at least one transmitter to the at least one receiver, the system comprising:

means for setting the power used for transmitting in the second channel, and

means for adapting a modulation and/or coding scheme used in transmitting in the first channel, comprising

means for controlling the choice of the modulation and/or coding scheme by means of the level of the power at each instant set for transmitting in the second channel.

19. (Previously Presented) A computer program product directly loadable into the internal memory of a digital computer comprising software portions for performing the steps of claim 1, when said product is run on a computer.

20. (Previously Presented) A computer program product directly loadable into the internal memory of a digital computer comprising software portions for performing the steps of claim 16, when said product is run on a computer.

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